

## Book Reviews

**CRC Handbook of Laboratory Safety. 5th Edition.** By A. Keith Furr. CRC Press, Boca Raton, FL. 2000. xvii + 774 pp. 18 × 26 cm. ISBN 0-8493-2523-4. \$149.99.

This latest edition of the *CRC Handbook of Laboratory Safety* will be an important resource for laboratory safety managers, researchers, and administrators. Besides an impressively detailed coverage of specific safety concerns for chemical, biological, and radiation research laboratories, the author provides a refreshingly frank and honest treatment of the "why" of laboratory safety and how it is that unsafe situations can develop even when apparently strict safety protocols are promulgated. Included within the scope of this book are not only the acute safety considerations of those within the laboratory setting but also environmental concerns as they apply, for example, to people who live in the vicinity of the laboratory.

Chapter 1 consists of an overview of the general principles of and responsibilities for minimizing risks associated with laboratory operations. The importance of complete organizational and individual support for an effective safety program is stressed. Chapter 2 provides a general framework for organizational response to emergency situations, as well as specific first aid and CPR instructions (at the end of the chapter). Chapter 3 is concerned with the design of research laboratory facilities and associated equipment, with thorough treatment of general and specific issues ranging from the effect of laboratory space allocation on room airflow and hood exhaust to the properties of different fire suppression agents. This chapter is an absolute must-read for everyone involved with the renovation, design, or construction of laboratory facilities. For bench scientists, Chapter 4 is the most useful. Important topics covered include but are not limited to: carcinogens as rated by relevant authorities (OSHA, State of California EPA, etc.); chemical storage incompatibilities; heat- and shock-sensitive materials; special hazards associated with handling radioactive and biologically active materials; flammability properties of commonly used solvents; explosive materials, especially as pertains to peroxide formation in susceptible compounds; and special dangers posed by exceptionally corrosive, toxic, or explosive gases such as HF, ammonia, acetylene, and chlorine. Chapter 5 has basically the same format as Chapter 4, but it is primarily geared toward laboratories dealing with radioactive and biologically active agents. Finally, Chapter 6 covers the use of protective equipment for laboratory workers with emphasis on respiratory protection.

The book is quite readable, with ample references, a good subject index, a plethora of helpful internet website addresses, listings of various applicable OSHA regulations, and tables of useful data concerning compound properties. The text is remarkably free from errors, given the length of the book (I found only one minor error). The author's comments are commonsensical, astute, and frequently thought-provoking (his observation as to the potentially deadly consequences of the

rupture of a 30-L Dewar flask full of liquid nitrogen on a slow moving freight elevator may result in my opting for the stairs in the future). His assessment of the special hazards faced in academic settings, with the combination of inexperienced beginning graduate students, lack of adequate safety training, and distressingly cavalier attitudes toward safety issues held by many research directors/professors, rings true.

In summary, this book is a valuable reference source and is a must for library collections and also for private collections of individuals who have major responsibilities in the safety area.

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**Methods in Molecular Biology, Volume 146. Mass Spectrometry of Proteins and Peptides.** Edited by John R. Chapman. Humana Press, Totowa, NJ. 2000. xiv + 538 pp. 15.5 × 23.5 cm. ISBN 0-89603-609-x. \$125.00.

This excellent text is a collection of 27 chapters discussing various aspects of the applications of mass spectrometry to the study of peptides and proteins, as well as an appendix authored by leading scientists in the field. This is the second volume of this work. The text provides several excellent discussions of the application of de novo peptide sequencing using tandem mass spectrometry. Also included are several very useful discussions of the determination of secondary structure. There are also several discussions of specific research applications of mass spectrometry such as, RPH: (1) Identification of Snake Species by Toxin Mass Fingerprinting of Their Venoms; (2) Rapid Identification of Bacteria Based on Spectral Patterns Using MALDI-TOFMS; and (3) Positive and Negative Labeling of Human Proinsulin, Insulin, and C-Peptide with Stable Isotopes: New Tools for In Vivo Pharmacokinetic and Metabolic Studies. The Editor in the Preface states that "One purpose of this collection...is to show the reader what can be done by the application of mass spectrometry, and perhaps to encourage the reader to venture down new paths." As a reader, I found this statement to be very true – I was encouraged to "venture down new paths". In my research I am interested in the role played by noncovalent interactions in peptide-biomolecule interactions. I therefore found the following discussions to be both interesting and, more importantly, thought-provoking: (1) Probing Protein-Protein Interactions with Mass Spectrometry; (2) Studies of Noncovalent Complexes in an Electrospray Ionization/Time-of-Flight Mass Spectrometer; and (3) Analysis of Hydrophobic Proteins and Peptides by Mass Spectrometry. The Editor further states that "More important,

another purpose is to demonstrate how these analyses are carried out in practice by guiding the reader, in a step-by-step manner, through the pitfalls and nuances of apparently straightforward techniques." In my opinion the book accomplishes this goal, with chapters discussing the following topics: (1) Sample Preparation Techniques for Peptides and Proteins Analyzed by MALDI-MS; (2) Influence of Salts, Buffers, Detergents, Solvents, and Matrices on MALDI-MS Protein Analysis in Complex Mixtures; and (3) Analysis of Proteins and Peptides Directly from Biological Fluids by Immunoprecipitation/Mass Spectrometry.

Due to space limitations I have been unable to list individually all of the topics covered in this excellent text. I highly recommend it as a reference source for all scientists interested in peptide and protein research.

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**Biodiversity. New Leads for the Pharmaceutical and Agrochemical Industries.** Edited by Stephen K. Wrigley, Martin A. Hayes, Robert Thomas, Ewan J. T. Chrystal, and Neville Nicholson. The Royal Society of Chemistry, Cambridge, U.K. 2000. vi + 314 pp. 16 × 24 cm. ISBN 0-85404-830-8. £59.50.

This volume presents a summary of the proceedings of an international conference "Biodiversity: A Source of New Leads for the Pharmaceutical and Agrochemical Industries" that was held at the University of St. Andrews in September 1999. The book is divided into 6 sections comprising 21 chapters and covering a wide range of microbial, marine, and plant product topics.

The 6 chapters in the first section "Natural Products – History, Diversity and Discovery" consider the historical development and potential future applications of microbial secondary metabolites and novel methods for examining new genetically derived products. Also included in this section are a review of drug discovery achievements and future directions at the National Cancer Institute and a discussion of drug screening and its relative success in natural product versus synthetic and combinatorial chemical libraries.

The second section "Microbial Natural Products Dis-

covery" describes current research on drugs of bacterial and fungal origin ranging from clinically useful anti-fungal products to inhibitors of signal transduction and lipoprotein-associated phospholipase.

"Marine Natural Products", the topic of the third section, is devoted to marine organisms as a source of novel new leads for drug development. Anticancer dolstatins that are produced by marine cyanobacteria and selective Cu<sup>2+</sup> binding modified cyclic octapeptides, the patellamides, are the subjects of detailed review.

The fourth section "Plant Natural Products" gives special attention to the exploration of regional flora. The first chapter considers water-soluble bioactive alkaloids. The remaining 3 chapters examine more general aspects, e.g., traditional plant product uses, phytomedicines, and "lessons from Nature".

The 2 chapters that comprise the fifth section "Biosynthesis" describe different aspects of the biosynthesis of polyketides that may find application in the derivation of new products.

The sixth and final section "Natural Products as Leads for Synthesis" focuses on the chemical synthesis of natural products and their derivatives. Specifically considered are the strobilurin fungicides which are produced from a wood-rotting fungus, a new strategy for the synthesis of the Prelog-Djerassi lactonic acid, and the preparation of some aminoacyl tRNA synthetase inhibitors with herbicidal activity.

The chapters in this book are generally very clearly written, with a great deal of excellent chemistry and biological information; also comprehensive and timely references are included. The volume concludes with an adequate subject index.

Products derived from natural sources have long been investigated in the quest for new drug products. The subject matter of this volume emphasizes that this quest continues unabated and is actually being enhanced by competitive pressure from the field of combinatorial chemistry and by recent advances in genetic engineering, high-throughput screening, and structure elucidation. The book provides a great deal of useful information that should interest researchers in both the pharmaceutical and agrochemical fields.

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